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Investigating the Eco-community Concept toward Socio-Spatial Quality in Sector 7 and 9, Bintaro, South Jakarta

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Abstract

Bintaro Jaya commits to carry out the Eco-community Concept in all of its development area, including sector 7 and 9. The Eco-community Concept aims to shape a sustainable environment; besides, it has another purpose to create and increase environmentally friendly community. Most of real estate growth in Indonesia has revealed individualist phenomena because developers only focus on the built-environment and they often override community needs that led to the deficient quality of environment and community. Otherwise, the Eco-Community implementation in sector 7 and 9 has claimed to have the sustainable urbanism eminence that strengthened and supported community lifestyle. Therefore, this paper investigates the Eco-community Concept in sector 7 and 9 based on the ecological architecture and sustainable urbanism by cultivating physical data, survey and interview with the developer. It discovers spatial and social quality in both sectors, then it fathoms about how the developer socialized the Eco-community Concept and how the community reacted and used facilities in both sectors. How does the quality of the built-environment and its community? How does the Eco-community Concept affect community lifestyle? Finally, this study will underline social and spatial pattern for better sustainable urbanism on other areas for the direction of improvement.

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1. Introduction

The growth of city inevitability contributes to global warming, but how we know if a city is sustainable. Thereof, this paper looks into one interesting study case in Bintaro Jaya that offers the Eco-community concept as a strategy to meet sustainable built-environment which engages its community to adjust sustainable lifestyle. Bintaro Jaya, a real estate property under PT. Jaya Real Property, has built 1.500 of 2.500 hectares planning area in South Tangerang. Notwithstanding the earlier concepts Bintaro Jaya, the Garden City and the Professional City, were derived from its area characteristic and its community characteristic; the Eco-community concept is trying to make a sustainable environment that implicates both developer and community by macro and micro built-environment and community action. On the other hand, the Eco-community is part of ecological architecture and sustainable urbanism because it outlines a sustainable master plan using integrated mass transportation and environmentally friendly buildings, then it continues to persuade and encourage community to adjust sustainable lifestyle.

Hereafter, this study investigates how the Eco-community influences built-environment and communities lifestyle toward sustainable urbanism and how built-environment triggers community doing sustainable lifestyle. The scope of this research area is limited to sector 7 and 9 in Bintaro Jaya, where both sectors are adjoining and applying the Eco-community concept; beside those areas have skyline discrepancy and multi-functional zone.

Fig.1. Research scope area in sector 7 and 9, Bintaro Jaya

In this paper, we are reviewing predecessor theories about ecological architecture and sustainable urbanism and analyzing field observation and interview results. Interviewing the developer has a purpose to gather information about background, strategy, and application of the Eco-community in Bintaro Jaya. Then, field observation is useful to understand how the result of Eco-community to the community in Bintaro Jaya, either being environmentally friendly or apathetic. In the end, this paper has a purpose for a further sustainable development by discovering how the theory and implementation of ecological architecture and sustainable urbanism in Bintaro Jaya. Next, we are discussing ecological architecture, sustainable urbanism and Eco-community concept.

2. Apprehending Eco-architecture, Sustainable Urbanism and Eco-community Concept

The human settlement study by Doxiadis emphasizes that nature, man, society, shell, and networks are corresponding each other. Hence, build-environment will affect nature, man, society and networks. In this paper, we are trying to understand how to diminish the negative effect on the environment by underlining ecological architecture and sustainable urbanism on the Eco-community application in Bintaro Jaya.

The term of ecology based on Oxford Dictionary is the branch of biology that deals with the relations of organism to one another and their physical surroundings. When ecology is related to architecture, they should create a harmony between nature, built-environment, and community. Ecological architecture (Eco-architecture) is a comprehensive study about environment, human, and buildings (Frick, 2007). So, basic theory of Eco-architecture should not be understood only as a product; however, Eco-architecture is a holistic system that implicates man and society to their environment, accentuates the development process and cooperates between man and environment. This correlation is mostly forgotten by developers when they built their projects. In the end, an Eco-architecture

development should mediate, both man and environment toward a sustainable environment.

Moreover, sustainable urbanism is communities' creation and support that have well-designed environment for high quality life when people will eagerly opt to meet their daily needs on foot and transit (Farr, 2007). Farr wrote that sustainable urbanism had five attributes, such as definition, compactness, completeness, connectedness, and biophilia. Human settlements development brings a big vision that affects the sustainable urbanism quality. It is supported by Congress of the New Urbanism, where good neighborhood definition should compact, pedestrian friendly and mixed use. So, it indirectly encourages a sustainable lifestyle that can be achieved through eco-friendly growth, new urbanism and green building.

The Eco-community concept is a compound idea between Eco-architecture and sustainable urbanism. It is not a sudden idea to do sustainable environment, but community in this concept has a great role to preserve the environment. Strategy development in Bintaro Jaya is a continuity concept, both vertical process (from developer to community) and horizontal process (from community to community). Finally, the Eco-community embraces both physical and social environments.

The Eco-community in physical environment has four strategies toward a sustainable environment and an environmentally friendly community. First, the Eco-community in macro scale provides green areas to save nature and community. Second, the Eco-community provides integrated mass transportation that links inside and outside Bintaro. Third, the Eco-community in micro scale can be categorized to Health Care, Earth Care and Energy Care. Health Care encourages community to care about their health and nature healthiness. Earth Care supports forest and nature preservation. Energy Care helps Bintaro Jaya community to save and cut electricity used. Forth, the developer is supervising environment by providing or fixing public facilities.

Besides, the Eco-community in social environment has a main purpose to urge and educate the community to do an environmentally friendly lifestyle. The community definition of this research is for all people who live, work and play in Bintaro Jaya. In the reality, the Eco-community social activities are still limited to people who live in Bintaro Jaya.

Afterwards, we can discover the Eco-community concept through social and spatial qualities. Spatial quality is how the Eco-community translated to the physical environment in Bintaro Jaya. And, social quality is how the Eco-community represented the community in Bintaro Jaya. Hence, we need to know Eco-architecture pattern for the next chapter.

3. The Pattern of Eco-architecture Implementation in the Eco-community Development Area

The Eco-community has been successfully adjusted to the local natural environment and communities in sector 7 and 9, Bintaro Jaya. It follows the Ministry of Home Affairs regulation number 1 in 2007 Republic of Indonesia about planning provision of green open space that must provide ecological value on each urban district. One example, when we enter Bintaro Jaya from Pondok Aren Toll Gate, there is a cypress hill, urban forest, for aesthetic purpose, for natural water absorption and for animal habitat. In addition, the river that flows along Bintaro Jaya is preserved and maintained toward a sustainable and feasible environment. Besides, it is equipped by polders to avoid flooding during rainy season. It has been proved that the Eco-community has a comprehensive design that adapts to nature, both green area and preserved-water area.

Fig.2. Adjust to the local natural environment in sector 7, Bintaro Jaya

Further action of Eco-architecture in Bintaro Jaya is conserving natural energy and saving non-renewable energy. The developer, Jaya Real Property, has made *Perusahaan Air Minum* (Water Company) Jaya that collaborates with

Perusahaan Air Minum Daerah (Water Company) Jakarta to manage and to supply clean water, so people do not use ground water. Unfortunately, communities around Bintaro Jaya are still using ground water because of no access from Water Company. Some green spaces are available as a public facility - *Taman Menteng* (Menteng Park) and as a certain public community on each housing cluster - Central Park in Kebayoran Residences, sector 7. The total of the green area is 2,8 hectares, where it has function for the city' lungs and for outdoor recreation area. And, Bintaro Jaya has Transit Oriented Development (TOD) to save non-renewable energy use, to make communities turn to public transport and to make less pollution.

Fig.3. Menteng Park
Source: http://kicaubintaro.co.id/

Next, maintaining the environmental sources, such as water, soil, and air is another way toward Eco-architecture. It has implemented by planting trees, dredging polders and streams, distributing different color garbage bags for organic and non-organic waste, and arranging trash cans for organic and non-organic waste in public space. Another Eco-architecture action for Earth Care is greenhouses in some clusters by choosing renewable material for house construction, selecting carport material for water absorption, using biophory techniques for water absorption, and applying roof garden for lower temperature inside the house. The lack of greenhouses is high initial cost, so only fewer people who are able to use it.

Fig. 4. Green house in Bintaro Jaya
Source: http://www.jayaproperty.com/ecomunity

Another Eco-architecture approach is maintaining and improving the natural circulation using renewable materials. This approach is as same as the Eco-community concept in micro scale, Health Care. Most of Bintaro Jaya houses are designed toward greenhouse which means all material selection should be environmentally friendly. Besides, houses are oriented to North-South to reduce direct sun exposure and to maximize natural ventilation. New house design is concerned about sustainable factors by selecting durable and reusable materials, for example Kebayoran Cluster using light steel roof structure, solar panel, Bio Tank, Roof Tank, Biophores, and shaded trees.

The reliance on energy system contributes to global warming, hence the communities need to reduce their reliance on the central energy and waste system, such as electricity and water. The Eco-community in micro scale is well-applied on each cluster depends on community' financial capability. Kebayoran View is one cluster that offering greenhouses that uses roof garden, solar water heater, biophory, and etc. The weakness of greenhouses is expensive cost, thus it needs to be adapted to every community class. Other actions to reduce reliance on energy system are started from urban forest to greenhouses and from construction to waste management.

Fig.5. Recycle garbage

Communities have an important role to achieve a sustainable environment, hence the community should actively participate in housing planning and maintenance. The Eco-community concept was from the developer, but it growth with the community. The solidarity between the developer and community is bound by some environmentally friendly events, such as healthy home contest, greenhouse contest, environmental essay contest, environmental poster contest and hygiene cluster contest. As the results of those contests knew each other and cared their environment.

Fig. 6. Ecovaganza contest
Source: http://kicaubintaro.co.id/

The development of Eco-community considers to how people move from one place to another place. Special free public transport in sector 7 and 9 connects each cluster, public buildings, and transit transportation. Pedestrian and bicycle paths only in sector 7 and 9 have been used to successfully trigger communities to go to live and work by bicycle or on foot.

Fig. 7. Bicycle and pedestrian path

The Eco-community lets communities to generate their daily needs on foot or by bicycle and public transport. This is possible if the range of public and social facilities is in a range for walking distance. Thus, Bintaro Jaya that already has twelve districts keep improving toward a sustainable environment by adding some facilities on each district. Sector 7 and 9 are good community examples because communities generate their daily needs to go to work, live and play in walking distance.

Fig. 8. Using bicycle to buy daily needs at the supermarket

Software technology thrives very fast, hence the use of technology for Eco-architecture is very useful. Kicau Bintaro is an online and printed media that are focused on the development and communities in Bintaro. This technology helps communities to interact each other in the middle of their busy day. Some clustered communities in Bintaro has used social media to do interaction because most of Bintaro communities are professional. Even though routine meeting between communities are held periodically for some evens. Here, the developer triggers the community to use technology to update new information.

Fig. 9. Community blog in Bintaro Jaya

Table 1. Eco-architecture meets Eco-community

Eco-architecture	**Eco-community Implementation in Bintaro Jaya**
Improve the natural circulation with renewable materials	Health Care encourages community to care about their health and nature.
Reduce dependence on central energy system (electricity, water) and waste system	Energy Care helps Bintaro Jaya community to save and reduce electricity use (LEED lights, solar water heater, roof tank).
Occupants participate actively in the planning and maintenance of housing	The solidarity between the developer and communities is bound by some environmentally friendly events (healthy home contest, green house contest, environment essay contest, and hygiene cluster contest).
Proximity and ease of access to and from the building	Pedestrian and bicycle paths have been used successfully to trigger the community to go to live and work by bicycle and public transport.
Generate their own occupants daily needs on foot or by bicycle/public transport	Public and social facilities is in walking distance.
Use simple/alternative technology or software technology	Kicau Bintaro Magazine, community blog and others social media for communication purposes.

4. The Pattern of Sustainable Urbanism Implementation in the Eco-community Development Area

The Eco-community in Bintaro Jaya has five attributes of sustainable urbanism, such as definition, compactness, completeness, connectedness and biophilia. The definition area of Eco-community is limited to sector 7 and 9 because both sectors have a rich diversity of land use and skyline where each housing cluster is near to public facilities. Besides, the limited amount of housing in each cluster made the community easier to control and interact each other.

Increasing sustainable effectiveness, compactness, is planned and applied by Transit Oriented Development (TOD) and Central Business District (CBD) that benefit the community and the environment. TOD reduces air pollution and fossil use, beside TOD helps to maximize pedestrian, bicycle path and green line. Despite there being CBD, but most of the communities who live in Bintaro Jaya is working in Jakarta, hence the future CBD development will accommodate the next generation communities in Bintaro Jaya to work on it.

Fig. 10. Rich diversity of skyline and land use

The communities can enjoy daily and lifelong utility, completeness, where all public facilities, like school, university, office, supermarket, hospital, and mall are in walking range in sector 7 and 9 Bintaro Jaya. Even there are many choices for living place based on the community life cycle for single person, new family and big family. The completeness accommodates community varied needs that led to a sustainable urbanism.

The connectedness is one attribute of sustainable urbanism that provides transit corridors as a linking neighbourhoods. Sector 7 and 9 are chosen because it is a contiguous sustainable corridor that integrates transportation system and integrates land use. Bintaro Jaya reinforces the community to walk, to ride a bicycle and to use wheelchairs for aging people by providing wide pedestrian and bicycle path in shaded places. These pedestrian and bicycle paths are existing only in sector 7 and 9, but they are disconnected to another district and surround area.

Biophilia is the name given to human love of nature based on this intrinsic independence between humans and other living systems (Farr, 2007). The Eco-community connects communities to nature by compact master plan, so there will be more preserve nature area. Some parks and preserved river have proven that Bintaro Jaya wanted to reach sustainable urbanism.

Hereinafter, the Eco-community in Bintaro Jaya has applied sustainable urbanism by selecting green building for housing clusters, new urbanism and eco-friendly growth. However, the sustainable urbanism should represent ten principles of eco-friendly growth that some of them have been discovered from five attributes of sustainable urbanism and Eco-architecture.

The first eco-friendly growth principal is creating many varieties of housing types which are related to completeness. Both districts 7 and 9 provide living place the community life cycle. There is an apartment in CBD to accommodate a single person or a new family, then there are some types of housing cluster to accommodate different family needs and social class. All housing clusters and apartment have fulfilled all five sustainable attributes. Notwithstanding some villages are over taking between Bintaro Jaya clusters, they live in peace.

Fig. 11. Housing cluster in Bintaro Jaya
Source: http://bintarojaya-nuke.blogspot.com/

The next sustainable principal is creating a walkable neighbourhoods that has just finished in 2014 along 1,5 km started from Discovery Cluster to Graha Cluster. The main road, Boulevard Street, engages TOD; where the road feature accentuates pedestrians or the communities who do not use the vehicle. Shaded and comfortable pedestrian walk and bike path are aside along the main road, but unfortunately those facilities only exist on the main road of sector 7 and 9 which are disconnected with other roads.

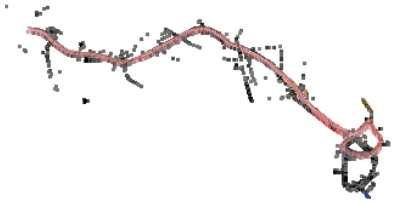

Fig. 12. Bicycle path (pink line) in sector 7 and 9 Bintaro Jaya
Source: Jaya Real Property, Tbk.

Fig. 12. The main road, Boulevard Street, Bintaro (left) and Graha Cluster Street (right)

Fig. 14. Narrow pedestrian (left), pedestrian on the main road (middle) and bike line on the main road (right).

Even though the Eco-community is friendly with pedestrian, biker and wheelchair user, but the physical development of Eco-community in Bintaro Jaya is limited to the main road. Pedestrian and bike line put on the main road to give a good impression, meanwhile they are not implemented in clusters. Besides inconsistency of pedestrian and bike line, there is not an exact standard for them. Unfortunately not all bike line has fulfilled safety standard for the bikers, where some lines are on the same level with the main road without any boundary. It happened because the development of pedestrian and bike line was not planned earlier in the master plan.

Fig. 15. Bus stop in front of office, Driving Range (left) and no bus stop in front of university (right).

Moreover, the Eco-community concept should provide well Transit Oriented Development which is equipped by bus stop. Unfortunately, the master plan in Bintaro Jaya is not a comprehensive design where not all buses stop are available. So people who are waiting for the bus, both inside Bintaro and outside Bintaro not always have bus shelter.

Furthermore, the collaboration between the developer and communities is important to execute the Eco-community social environment. It is vertical and horizontal processes from developer to community and from community to community. The developer facilitates the community to have an environmentally friendly lifestyle, then the community educates other communities to make sustainable lifestyle. Bintaro Jaya has become environment ambassador to promote sustainable lifestyle and it sets Car Free Day to let the community doing physical exercise and social interaction on the main road. Other activities are environmental contest, selecting garbage, free emission gas test and etc.

Fig. 16. Car free day in Bintaro Jaya
Source: http://kicaubintaro.co.id/

Fostering distinctive and attractive place is one of sustainable principal to amplify sense of place. The Eco-community concept in Bintaro Jaya uses park to strengthen the sense of place. The transition of each district has no representative sign when people rarely realize the boundary of each district in Bintaro.

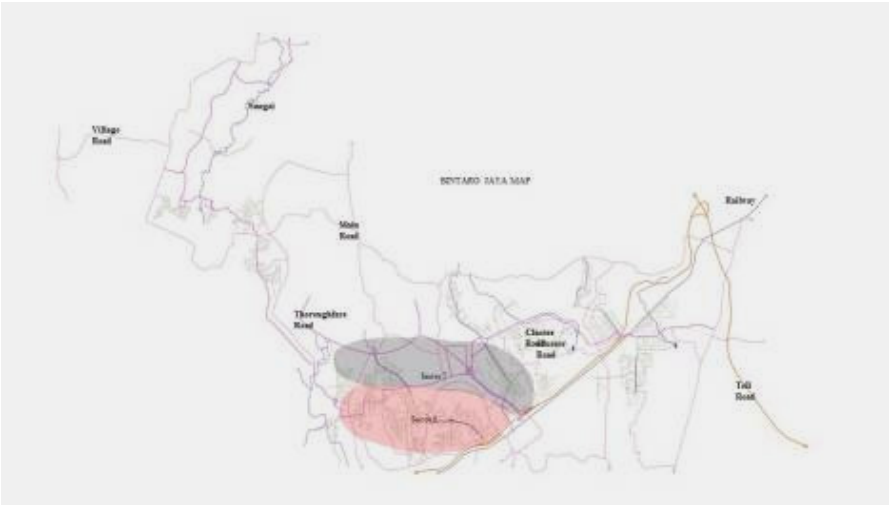

Fig. 17. Car free day in Bintaro Jaya
Source: self-tracing from http://kicaubintaro.co.id/

The development of Bintaro Jaya is predictable, fair and cost-effective as same as the sustainable urbanism. The next Eco-community program is planting rare trees to educate community and conserve nature, placing social and public facilities in walking range, providing pedestrian walk and bicycle path, integrating public transportation in Jurang Mangu Station, combining trees and pond to reduce temperature, offering greenhouse technology, using solar power, cultivating waste, and providing clean water.

Mix-used land is compact and complete principal of sustainable urbanism that has been applied to sector 7 and 9 Bintaro Jaya. Those sectors made the city has more life, which are completed by CBD. The community can walk or ride bicycle to go to work, study and play because of short distance.

Bintaro Jaya preserves open space, urban forest and river from macro to micro scale. Those nature environment are improved and enhanced by defining clear boundary to avoid illegal buildings. Besides, the preservation has functions to protect ground water and nature habitat, to give community green space and to avoid flooding and pollution.

Last sustainable urbanism principal is providing transportation varieties that are integrated to Transit Oriented Development (TOD). The main road of Bintaro Jaya has two Toll Gates to Jakarta and Soekarno Hatta airport. There are three kinds of public transportation that link to other city, such as train, X-trans Bintaro, and city-trans. And, there are some choices for public transport inside Bintaro Jaya, In-Trans Bintaro. Not only public transportation, Bintaro Jaya gives pedestrian walk and bicycle path, which are integrated with other public transportation.

Table 2. Eco-friendly growth meets sustainable urbanism in Bintaro Jaya

Eco-friendly growth	**Sustainable Urbanism Attributes in Bintaro Jaya**				
	Definition	**Compactness**	**Completeness**	**Connectedness**	**Biophilia**
Many choices for living place based on the community life cycle	✓		✓		
A walkable neighbourhoods	✓	✓	✓	✓	
Collaboration between developer and communities	✓				✓
Fostering distinctive and attractive place	✓				

Eco-friendly growth	Sustainable Urbanism Attributes in Bintaro Jaya				
	Definition	Compactness	Completeness	Connectedness	Biophilia
The development is predictable, fair and cost-effective	✓	✓	✓	✓	✓
Mix-used land	✓	✓	✓		
Preserves open space, urban forest and river	✓		✓		✓
Public Mass Transportation and Transit Oriented Development	✓			✓	

5. Conclusion

The Eco-community is an excellent concept towards a sustainable environment and a sustainable lifestyle. Although Eco-community implementation was begun in 2000, but it could solve individualist and apathetic community problems who live in clusters. From this case study, we can find the patterns of built-environment and community; where the physical development has a great influence to shape the community lifestyle and the community participation has a big role to support sustainable environment and educate other communities.

Both theories that underline the Eco-community Concept, Eco-architecture and sustainable urbanism, are applied well both in macro and micro scale in Bintaro Jaya. Eco-community is a holistic system between community and environment as same as Eco-architecture. And, Eco-community is a sustainable urbanism where it has all attributes, such as definition, compactness, completeness, connectedness, and biopholia. The implementation in sector 7 and 9 has proven that a sustainable environment should be started from the developer to the community and from community to community. On the other hand, the key strategies to achieve Eco-community are how we integrate sustainable physical and social environment and how we make an environmentally friendly community.

Besides, Eco-community encounters some challenges, mostly it is not coming from its community, but it is from surround community. We can see that translating sustainable theories to physical environment is easy, but it is hard to educate community to maintain its environment and to have sustainable lifestyle. On the other sides, Eco-community application needs spacious and continuity development area which is expensive. Sector 7 and 9 have previous villages in between their development area. Hence, there are social and environment gap between Bintaro Jaya and area surrounds it. Vandalism is not from Bintaro Jaya community, and it damages public facilities in Bintaro Jaya. Notwithstanding the public facilities are for everyone, but the behaviour of community around Bintaro Jaya can be a thread to physical implementation of Eco-community. In addition, Eco-community concept has stopped in its area without transition to villages surround it, where the boundaries between clusters or between development areas of Bintaro Jaya become a threat to achieve Eco-community. Hence, the Eco-community concept is inconsistency in Bintaro Jaya because it is only applied on the main road but it is not applied on road inside clusters.

The provisions of TOD and CBD encourage the community to make a sustainable lifestyle. Even there are still fewer ideal communities who live, work, and play in Bintaro Jaya because most of them are commuters who work in Jakarta; but Eco-community development in those sectors are expected better for the next generation.

Finally, this paper discovers that Eco-community application in Bintaro Jaya can be a pilot project for other areas that want to make a sustainable environment. Spatial and social pattern inside clusters are successfully applying Eco-community. But the boundaries between clusters or between development areas of Bintaro Jaya has become a threat to achieve Eco-community. And the patterns of successful Eco-community are only inside cluster road and thoroughfare road. Whereas the transition of the main road to village road becomes the weakness of Eco-community. From this study, there are still unanswered questions related to surround the area and communities that still open for the next research.

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